SPACECRAFT RADIO SCINTILLATION AND SCATTERING OBSERVATIONS OF THE HIGH LATITUDE SOLAR WIND NEAR THE SUN

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Radio scintillation and scattering measurements using coherent spacecraft radio signals are useful for probing the solar wind inside 0.3 AU where direct spacecraft measurements have not yet been possible. It has recently been demonstrated that during the late declining phase of the solar cycle such measurements provide information on large-scale solar wind structure, which can be related to solar features and direct spacecraft measurements at larger distances (Woo and Gazis, *Nature 366*, 543, 1993).

In this paper, we will summarize further radio scintillation and scattering results on large-scale solar wind structure obtained during solar minimum conditions. These include: (1) the latitudinal variation of solar wind speed and mass flux in the acceleration region (3-8 $R_\odot$) of the solar wind, and (2) the variability and radial variation of mass flux in high- (associated with coronal holes) and low-speed (associated with streamer belt) solar wind.

We will also present preliminary results obtained from current Galileo and Magellan radio scintillation measurements of the near-Sun solar wind. These measurements are interesting not only because they take place during the late declining phase of the current solar cycle, but also because they include high latitudes in the southern hemisphere (as close as 4 Ro over the south polar coronal hole) at a time when Ulysses is directly observing the same hemisphere at latitudes exceeding 35° but at a distance of 2 AU.

Keywords: high latitude, radio scintillation, inner heliosphere, Galileo, Magellan

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